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**Directed differentiation of human pluripotent cells to ureteric bud kidney progenitor-like cells.**

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**Public Summary:**

Diseases affecting the kidney constitute a major health issue worldwide. Their incidence and poor prognosis affirm the urgent need for the development of new therapeutic strategies. Recently, differentiation of pluripotent cells to somatic lineages has emerged as a promising approach for disease modelling and cell transplantation. Unfortunately, differentiation of pluripotent cells into renal lineages has demonstrated limited success. Here we report on the differentiation of human pluripotent cells into ureteric-bud-committed renal progenitor-like cells. The generated cells demonstrated rapid and specific expression of renal progenitor markers on 4-day exposure to defined media conditions. Further maturation into ureteric bud structures was accomplished on establishment of a three-dimensional culture system in which differentiated human cells assembled and integrated alongside murine cells for the formation of chimeric ureteric buds. Altogether, our results provide a new platform for the study of kidney diseases and lineage commitment, and open new avenues for the future application of regenerative strategies in the clinic.

**Scientific Abstract:**

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